RECLAMATION
Managing Water in the West
U.S. Department of the Interior
Bureau of Reclamation

WATER PRIZE COMPETITION CENTER

Detecting Leaks & Flaws in Water Pipelines – Stage 1

Planned Launch: Fall 2017

Problem Statement: As the nation's largest wholesale water supplier, the Bureau of Reclamation provides irrigation water for 10 million acres of farmland that produce 60 percent of the nation's vegetables and 25 percent of its fresh fruit and nuts. In addition, Reclamation delivers water to municipal water districts that supply 10 trillion gallons of water for household consumption to more than 31 million people each year.

Reclamation's water conveyance system includes over 20,000 miles of buried pipelines made of various materials including metal, plastic, concrete, and composite. Municipal water utility collaborators also have extensive transmission and distribution pipeline networks. Pipeline components, such as joints, fittings, valves, linings, and individual pipe sections are subject to leakage due to damage, corrosion, and other types of degradation. Detecting water loss from pipelines will trigger appropriate maintenance, allowing conservation of scarce water resources and more reliable service to clients.

Presently, the available water pipeline leak detection techniques include aerial flyover inspections, acoustic or electromagnetic evaluation of pipe integrity, visual inspection of interior surfaces, and flowrate disparity analysis. While these techniques might be suitable for determining general system delivery information or for close evaluation of small pipeline sections, none accommodate the needs to efficiently inspect thousands of miles of pipelines and to precisely determine leak location and severity. In addition, many of the techniques are unable to inspect the pipe while it is in service (pressurized, flowing water in pipe) or cannot overcome operational complications such as limited pipe entry points, diameter changes, elevation changes, or lateral bends.

The solution we seek: We seek methods and technologies that can reliably and easily detect leaks and flaws in operating, pressurized water pipeline infrastructure regardless of size, depth of burial, pipe material or interior lining. Our primary focus is finding condition assessment solutions for 48-inch or greater pipe diameters and for steel and prestressed concrete cylinder pipe types, although solutions for all pipe types and diameters greater than 24 inches will be considered.

Prize Competition Scope: A two-stage competition is envisioned, with Stage 1 consisting of white paper submissions to find the most promising theoretical solutions. Reclamation will fund a $75,000 prize purse to be split among winning eligible solvers. Depending on the results of Stage 1, a second stage consisting of a laboratory or field prototype demonstration may be launched in 2018. The prize purse for Stage 2 will be considerably more than Stage 1, and Reclamation plans to invite commercialization partners to seek potential business opportunities with participants.

Collaborators:

RECLAMATION Managing Water in the West
San Diego County Water Authority
The Metropolitan Water District of Southern California
Southern Nevada Water Authority
LA DWP Los Angeles Department of Water & Power
Denver Water

https://www.usbr.gov/research/challenges/leakypipes.html